DEFECTIVE DRAINAGE AS A CAUSE OF DISEASE

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THE subject of my address to-night is not of my own selection. It has been assigned to me by the Committee of the Manchester and Salford Sanitary Association. But I could not myself have chosen a subject of greater importance, for I know of nothing that has a more general, immediate, and practical relationship with public health than the state of drains, both public and private.

At the same time it cannot be denied that very much has been written, spoken, and reported of late upon this subject; and I am unable to hold forth any expectation to the public that I shall be competent to advance any new matter. But the importance of the old matter is so intimate and extensive, and at the same time so little appreciated, that what is true, though not new, will well bear reiteration. In fact, in this department of knowledge it must yet be "line upon line, and precept upon precept; here a little, and there a little;" or, as Abraham Lincoln used to say, we must be continually "pegging away," until the public conscience is awakened, and the public mind generally informed, upon the vast social and economic issues involved in good or bad arrangements for the removal of refuse.

Speaking in round numbers the preventable deaths occurring in England and Wales reach an annual sum of 170,000.* This is surely an immense total to be one of annual recurrence, and of generally equal incidence. But I may go a step further and say that the whole of this vast number of preventable deaths is associated more or less directly with defects in drainage.

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* Dr. Richardson, in his recent work, "Health and Life" (Daldy, Isbister, and Co., page 172), gives 210,000 as the number of those who die annually in England and Wales from preventable diseases; but I wish to speak within the mark, both here and elsewhere, in referring to such matters of calculation in the present address.

I will not exclude even deaths from intemperance, nor from the filthy habits of a large class of the population. Nothing is more familiar to clergymen, district visitors, inspectors, and medical officers of health than that a low class of dwellings and defective arrangements for the preservation of cleanliness in a house surely beget and perpetuate a want of decency which leads to demoralisation, brutishness, and crime. There is a reaction in this matter. Sottishness and crime seek filth; and filth and discomfort at home drive to drink and brutality. Prostitution, even, is often the outcome of a squalid dwelling. Thus they that are house reformers *only* are doing a great work as social reformers also; and, on the contrary, they that keep up a low and condemned class of houses for the poor are promoters, not only of sickness and death, but also of crime and moral degradation. I have known owners of such properties who preach the Gospel on Sundays and collect their rents from the lowest hovels on the week-day. Such persons are manufacturing virtue possibly by the ounce, but vice certainly by the ton!

Some may think that consumption, as a cause of death, should be excluded from those complaints with which this lecture is concerned. On the contrary, I shall have to show in the course of this lecture that deaths from consumption take the first place in order and in point of importance amongst such as are the result of defective drainage.

The same may be said of the large number of deaths ascribed to the use of polluted water. For what is the worst source of water pollution? Nothing of much importance to public health, except unremoved or badly-drained refuse matters. Chemical or mineral impregnations are of rare occurrence in comparison with such as are of an animal character; and the use of water thus contaminated is the reception into the system of poison in its most subtle, insidious, and assimilable form. To all these we shall return again by-and-by.

In the last decade, or period of ten years, of which the statistics have been furnished to us by the Registrar-General—that of 1861–71—there is an annual average total of deaths in England and Wales amounting to 479,450, or nearly half a million. I take a decade because we always arrive nearest to the truth in vital statistics when we draw our conclusions from as large a basis of calculation as possible. It is not fair to estimate vital statistics from figures belonging only to a small population, or even to a large population, for only a short period of time. This yearly half million of deaths gives, upon a population of upwards of twenty-one million, an annual death-rate of 22·4 per 1,000. Out of this number, 164,170, or 33·9 per cent, or rather more than a third, are ascribed to diseases preventable in their origin and nature—to diseases, in fact, connected immediately or more remotely with defects of drainage. In other words, defective drainage is the cause of a total loss to the country of one-third of its entire mortality, and raises the annual death-rate from 14·8 per 1,000, which it would otherwise be, to 22·4. If this be not an affecting consideration, overwhelming in its magnitude, I know not where to look for one.

And we may easily convince ourselves that this is no exaggerated statement; for in the circle of our own acquaintance there is hardly a house known to us where deaths have not occurred at one time or another because "there has been something wrong with the drains." It is like the last and greatest of the plagues of Egypt, of which it is recorded, "from the first-born of Pharaoh that sat on his throne to the first-born of the captive that was in the dungeon . . . there was not a house where there was not one dead." This is hardly true, for our Prince of Wales, thank God ! escaped; and gaols, from the attention that has been paid to their drainage, are the safest places to be located in for exemption from typhoid and such diseases.

But we are further called upon to notice that to one case of death from these complaints there is a usual proportion of at least ten cases of non-fatal illness. This gives us an annual total of 1,641,170 cases of lingering, painful, and disabling sickness continually endured by the country, but all preventable by known and attainable means. Boards of guardians will have some idea of the immense pecuniary expenditure involved in so vast a sum of human suffering, which falls far the most heavily upon the poor, or upon those who, at the first moment of disablement, become chargeable upon the rates.

In Manchester and Salford the proportion of preventable mortality is still greater. Here, with an average annual death-rate of 28·5 in the decade in 1861–71, there is a preventable death-rate of 36·5 per cent of the total deaths from all causes.

And it must be considered that this is a mortality amongst all classes and ages, always going on—and everywhere alike—not exceptional as to time or place, like a time of war or a great calamity in a mining district. These latter awaken much more attention and evoke much more sympathy; but they are only as a drop in the bucket in comparison with the enormous sacrifice of life to which this Association would direct the attention of the country.

The case may be stated thus: Supposing we regard our public health authorities and their officers, and house-builders (being more or less under them), as an army, the generalship and soldiership are so bad that there is a yearly loss of 170,000 unoffending civilians, from causes distinctly controllable and preventable by a properly equipped department. And in this fearful sacrifice the public mind complacently acquiesces. Talk of Cetewayo! His human offerings are nothing to this. Judged by a numerical estimate of victims he is an angel of mercy compared with ourselves; and the annual slaughter must proceed until we can penetrate and break up the serene indifference of modern civilisation.

Why should there be an inquiry about a military disaster or a mining accident, and not about a far more fatal epidemic of fever or diphtheria? The causes being equally determinable why should there be conscience of guilt as applicable in one case and not in the other? On what logical plea is the smaller sacrifice of the same commodity—life—dealt with as of more concern than the larger?—nay, the smaller regarded as of infinite concern and the greater of none! It is questions like these which the Manchester and Salford Sanitary Association would be continually asking until the public mind is alive to their importance, and the public conscience and public sympathy are less partial and less illogical in their distribution.

"Providence" is yet made the bugbear to which is ascribed an indefinite amount of preventable mortality. Such a superstition is the parent of acquiescence, as incredulity, the result of traditional ignorance, regards with suspicion and aversion all preventive measures. Nay, I remember when the cattle plague was regarded as a providential judgment for national sins; and the very expression "stamping it out" was characterised as impious and atheistical. And though the public may be better taught now, yet it will be some time before there is anything like a general conviction that the charges of impiety and atheism lie all the other way.

On the other hand, our Health Laws, which are based upon the laws of nature and of God, and which are designed to save the country from the reproach of so vast an amount of preventable loss of life, are still by many regarded with suspicion and resentment. A man even thinks he has a right to build an unhealthy house or an unhealthy town if he likes.

Laws, however beneficial, if they interfere with the liberty of the subject, and are in advance of public conviction, must always be unpopular, and to a certain extent unsuccessful. It is therefore to education, and not to a multiplication of timidly conceived statutes, that we must look for solid advance. Hence the superlative value of the work of the Manchester and Salford Sanitary Association.

It is principally our drains and sewers that are made very torpedoes of destruction to an unsuspecting population. But I fear no human "crinoline" will be invented as a safe protective garment. What has become a spear must be turned back into a pruning-hook. In its proper use and construction, what is too often an engine of suffering is designed to be one of convenience. But so it can only be made and kept by an enlightened, appreciative, and co-operative public.

Unfortunately, the evil is underground, away from sight and observation, hence too often away from thought. A false delicacy also hedges in the subject from popular comment. The evil is a hidden and a nasty one. But these may be the very reasons why those who are responsible should be more earnest in the matter.

A reference to the construction of the human body will show how suicidal it is to give scant attention to parts that are concealed, or that are not nice. For what is the human body itself but a mass of hidden drains, large and small? And how directly the health of the individual is dependent upon their condition! Having its several larger channels, the body has also drainage connections between these and every part. There is no gland, no organ, no muscle or nerve even, but has its full complement of drains for the continual removal of effete material; and obstructions, congestions, deposits, and other diseases, are nothing more than "having something wrong with the drains."

Indeed, the vastly complicated framework of the human system, with its adaptations to the supply of every want of which the mind can be conscious, is a fit symbol of the no less complicated conditions of modern civilisation or social life. The lower classes of animals, with their simpler requirements, have no such intricate arrangement of drainage tubes as is needful for the higher organisation of man. And similarly, urban life, or life in towns, presents infinitely more points of liability to disorder than rural life in the forest or the field; just as a harp with a thousand strings is exactly a hundred times more apt to be out of tune than a lyre with only ten. But in addition to this numerical increase to the same chances of disorder, we have an entirely new class of diseases induced by, and belonging to, the conditions of social life. Of this, more by-and-by.

But what is the necessity for drainage at all? The necessity lies in the very first elementary condition of LIFE—that is of animal life—namely, that all the manifestations of life involve two processes, those of waste and of repair. And it is with the former—the removal of waste material—that drainage, either in the individual or social body, has to do, and life essentially and always involves the going on of these two operations. Every action, every thought, every dream even, is accompanied with wear and waste of substance, muscle, brain, or some other part of the frame, and the drains are for the continuous removal of the effete, spent, and used-up material. This is what is done in the human body, very often without our knowledge or will. If we are healthily endowed, with our drainage system in good order, this unceasing work goes on without hitch or nuisance. And what we thus have in the individual body we want also in the village or town, namely, the systematic, noiseless, almost unconscious, removal of otherwise pernicious and accumulating refuse.

And when we come to crowded social life the amount of this exhausted material accumulates with every single addition to the population; and the greater such accumulation the greater becomes the social peril consequent upon any hindrance to its displacement. Such vast accretions of noxious matters are, in a sense, unnatural, and it is important to observe that their being inefficiently dealt with is the cause of an entirely new class of diseases; for the putrefactive or fermentative process comes into play with such substances when they are not disposed of according to nature, and a reaction in the human frame ensues. A kindred fermentation of one kind or another is engendered in the human blood; and hence arises the whole crop of zymotic or blood-ferment complaints. Of such a kind are nearly all fevers and blood-poisonings, which are always traceable to an improper association of living with dead substance, or with dead substance in a state of putrefactive fermentation.

But in the perfect economy of nature removal simply is not the only requisite—indeed, it would be an awful thing if it were. It would be fearful to contemplate the accumulating refuse of towns if it were simply stored in some place, either near or remote, like mountains of slag or cinders near iron works or furnaces. On the other hand, the animal and VEGETABLE kingdoms co-exist in a beautiful state of mutual interdependence. And as the vegetable kingdom pays tribute to man in affording beauty to the world and sustenance to the body, either immediately or through other animals, so do the exhausted tissues of men and animals become the essential nutriment of trees, fruit, and flowers. In the chemistry of the earth, to which the divine law enjoins the consignment of all animal refuse, this wonderful transfiguration is effected, and it is in the two processes—waste and transformation—that the health of the race, the adornment of the earth, and the order of nature, are secured.

It may have been on this account that in the symbolic age Adam was made a tiller of the ground. Many other occupations would have fulfilled the curse so far as the sweat of the brow was concerned. But the sweat of the brow, or the waste of life and labour, was directed to be wrought into the ground; showing that as the mystery of evil sends us all finally to the earth, so in the continual transfiguration of our own buried substances we are ever illustrating our redemption, and prefiguring our own final resurrection in new and amended forms of life and beauty.

And here I may observe how, practically, there are to the great majority of persons yet but four elementary substances in Nature—fire, air, earth, and water. The ground upon which a house is built is the earth. There is no inquiry into the composition of its strata; no consideration of the amount of ground-damp; no knowledge of the earth as a breathing thing, at one time discharging emanations, or at another, if of a dry and antiseptic quality, destroying them. Air and water, too, are practically unknown by the multitude to be compound and variable substances, of which no two samples from different sources are precisely identical. They are thought to be pure elements, and are drunk and breathed as such. People can never apparently understand that bright and sparkling water may be highly charged with poison far more deadly than a slight admixture of substances offensive to the sight. As reasonably might the cobra be thought to be a harmless reptile from the brilliance of its burnished scales outside. And the same with air. The only quality desired in the air in a house is warmth; and every sacrifice of the possibility of purity is made in order to secure the only condition appreciable to the sense.

What we want people to understand is the close dependence of health upon these, not simple, but compound substances; that water from time to time requires examination; and that air, if not continually renewed, is always air *plus* animal *débris*, unfit for human breathing, and the occasion always of sickness, sometimes of a serious and fatal kind.

A house might, in the popular mind, be a fifth form of matter in a state of elementary simplicity. A house, if it be a thing that affords protection from the weather, with accommodation to eat and to sleep in, meets all traditional requirements. The idea of health in connection with the arrangements of a dwelling is a new and generally unknown conception; and though recognised by the Legislature it will perhaps take another generation before houses will be at all generally estimated by the public from the only proper standpoint, namely, the fitness or not of their construction to secure the health of their inmates.

It must not be thought that the efficient drainage of a house includes only the removal of the daily amount of refuse of various kinds. The first and no less essential drainage required is that of the ground-damp from the subsoil of the dwelling. In fact it may be stated as an aphorism that, for ideal perfection, there should be complete isolation of the dwelling from the ground. A necessity, arising from a rapidly increasing population, of bringing every part of England under cultivation has led to the almost universal drainage of all our old fen and marsh districts. Hence ague is not now a familiar disease in this country. But there is much sickness short of ague, but of an aguish character, such as rheumatism, neuralgia, colds, toothache, &c., all which are greatly promoted or entirely produced by undrained dampness in the basements of dwellings.

But in addition to such smaller sicknesses, which, however, in their recurrence are sufficiently trying, abundant statistical proof was given by Dr. Buchanan in his reports—1866 and 1867—that the death-rate from consumption is very much affected by the state of the foundations of houses in regard to dampness; and in 1868 Mr. Simon, in his report to the Privy Council, gave a list of towns that had benefited by drainage, showing that in many the annual deaths from consumption had been reduced in amounts varying from 20 to 50 per cent.

In fact it may be maintained that our large national mortality from consumption may be due to the conception, inherited from our remote ancestors, that a dwelling partakes more or less of the character of a cave. An underground cavern was the Saxon notion of a house. Such may still be seen about Nottingham, the name of which place is derived from the Saxon word *Snottingha*, a cave. And what are our underground cellars, all connected with the house, but damp caverns, in which the moisture from the earth condenses, to be sucked up into living rooms by the heated and lighter air above? With such traditional faults of construction the complaint identified with such fault becomes an accustomed inheritance; but the enlightenment which in course of time will remove one will also remove, and is gradually removing, both.

But dampness and consumption are not the only evils of an undrained subsoil. A damp floor is three or four degrees colder than a drained one; and the damp, as it rises in the ground, forces emanations into the dwelling, which are the occasion of the unpleasant smell associated with this unhealthy condition. If the soil be that of a town, and consequently pervaded by the refuse of former occupations, the seeds of many specific fevers and other diseases may arise in emanations of this kind. Hence the frequent prevalence of zymotic complaints in times of abundant rainfalls, when people are congratulating themselves that their refuse drains are being well flushed. But subsoil drains do not exist. The house is not isolated from the earth; and the rising water displaces earth gases, charged with the germs of former pestilences, which are received into the dwelling to do (what is in appearance only) their mysterious work of blood-poisoning and death.

And now as to refuse drains. Every house requires a drain, and every conjunction of houses a sewer.

I will dismiss with a few words single houses, arranged on the dry system, away from sewers. Even stop-drains should be disconnected from the dwelling. Two principles control the disposal of excreta—removal and disinfection. In the old-fashioned pit-privy the earth is more or less a disinfectant. But here there is storage rather than removal. In the modern pail system there is necessarily frequent removal, but no contact with the earth for disinfection. The proper arrangement would combine both. Employ the pail for protection of soil and frequent removal, but disinfect by daily application of dry earth or dry ashes. Deliver slops always and everywhere in the open air, over a trapped gully, or into a disconnecting trap.

It is frequently mentioned as an argument against the system of water-carriage that houses are thus linked together, and poisonous emanations may pass through connecting tubes from one house to another. Most true. Far be it from me to understate or underrate the frightful hazard. How few, indeed, understand the sanitary conditions of their own houses! How few know that they are living over pent-up pestilences of their own and others' making—pestilences produced by present disease, or by noxious substances detained about dwellings in the very arrangements which are designed and constructed for their removal!

And yet how simple is the answer to the objection stated above, in the first supreme law in regard to soil-pipes and sewers or cesspools, namely, that every soil-pipe connected with a house should be disconnected from the sewer by a double trap, having an opening to the outside air, between the sewer and the dwelling. The universal enforcement of this simple law would at once place all sewers outside houses, and remove for ever from shut-up rooms all the evils that the admission of air from the sewers is so well able to accomplish.

In addition to disconnection of soil-pipes they should always, for self-ventilation, be continued, without bends, full-bore, to have an opening in the outside air, above the eaves of the roof.

All other waste-pipes, such as those from baths, lavatories, housemaid's and kitchen sinks, and save-all trays, should have no connection with the soil-pipe whatever. As mentioned before, these should "deliver always and everywhere in the open air, over a trapped gully, or into a disconnecting trap."

Overflow pipes from cisterns should be severed in like manner from the soil-pipe and the sewer. These, as containing nothing but pure water, may be popped through the wall anywhere; or, as flush-pipes, may usefully be conducted to the outside gully for slop-water.

But errors of design do not by any means include all those that have often had most fatal effect in houses and towns. Probably no class of work in the civilised world is so systematically "scamped" as work about houses OUT OF SIGHT, in connection with drains for removal of refuse. Hence the certain danger of every closet situated in the middle of a house, with its soil-pipe conducted under floors of rooms or indoor passages. It may be taken as a moral certainty that either ignorance or dishonesty has controlled the work; but either alternative is attended by equally fatal results. Thus we find putty joints to lead pipes, the use of rotten and corroded lead, ends of contiguous pipes ill-adjusted, no fall, free access to rats, midden refuse used for mortar, joints opened by settling of foundations, and many other faults, perpetrated ignorantly or dishonestly by speculating builders, all which have the certain consequence of allowing escape of gases or filth under floors, with the inevitable sequel of *mysterious* (?) sicknesses and deaths.

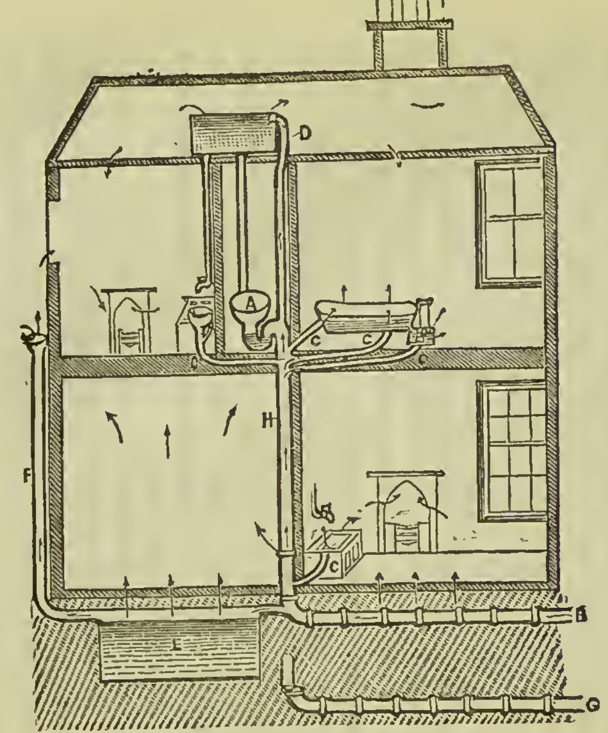
If the foregoing remarks be considered in detail it will be seen that nearly all possible sources of danger in the arrangement and construction of the drainage of houses have been pointed out. Reference may usefully be made to the two accompanying diagrams, in which many faulty arrangements, and their correction, are comprehensively depicted. (See next page.)

But there is another concealed and unknown but very serious cause of disaster in old houses and mansions which may be well introduced by a consideration of the early history of house drainage.

Sewerage and house drainage have always co-existed with civilisation, and have an equally ancient origin. Sewers are found amid the rivers of Nineveh and of Rome, those of the latter having been allowed to pollute rivers, but not the former.

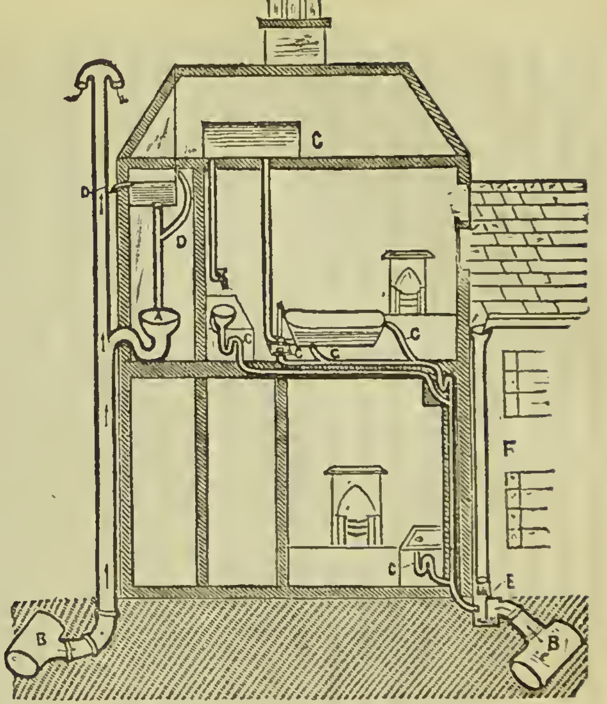
In Great Britain the first water-closets were undoubtedly mischievous, being conducted into highway drains or cesspools within the precincts of dwellings. They could have been little less dangerous though less unsightly than the absence of all sanitary arrangements about Norman castles, which are said to have been sinks of filth, both within and without. In time the nuisance arising from water-closets became so great that various Local Improvement Acts were obtained to prevent their connection with drains or sewers in the public highways. The inevitable consequence was the rapid multiplication of cesspools within the basements and yards of dwellings. Thousands of these are said to exist in London, Manchester, Birmingham, and other large towns, some of the larger houses having several. At any rate, it is stated in a recent report on sewage disposal, presented to Parliament in 1876, that so recently as the year 1850 there were 53 cesspools within the basement of Windsor Castle, all full and overflowing. We know also that the same concealed source of danger existed at Marlborough House before the invasion of fever compelled research, discovery, and alteration.

Thus it will be seen that in investigating the sanitary condition of old houses, or new houses upon old sites, not only the character of the recent work has to be ascertained but the nature of the subjacent soil also; and as in urban districts the houses of the



HOUSE WITH EVERY SANITARY ARRANGEMENT FAULTY.

A Water-closet with soil-pipe in middle of house.
B House drain under floor of room.
C C C C Waste pipes untrapped, communicating directly with drain.
D Overflow pipe of cistern turned into soil-pipe, and acting as ventilation of drain.
E Rain-water tank under floor, with overflow untrapped into drain.
F Fall-pipe communicating with drain opening under bedroom window.
G Drain under floor, with joints unluted, and pipes laid without a fall,



HOUSE WITH FAULTY SANITARY ARRANGEMENTS AVOIDED.

A Water-closet with soil-pipe outside the house, and ventilated by a large pipe carried up and away from all windows or chimneys.
B House drains outside house.
C C C C Waste pipes trapped, disconnected from drains by gully E.
D Overflow of cistern into open air, or supply pipe.
F Fall-pipe near bedroom window discharging into gully, not into drain.
G Domestic cistern separate from water-closet system.

These Diagrams are copied from a lecture on "Dangers to Health poor are now often placed on situations formerly occupied by the rich a subsoil polluted by the refuse of former generations may be the cause of the endemic unhealthiness of localities recently well provided for, such unhealthiness being otherwise unsusceptible of explanation.

It will have been seen in the course of my lecture that the diseases which proceed from defects in drainage find their cause generally in the pollution of the atmosphere in dwellings. If from any of the defects of construction enumerated previously air from a sewer is allowed to pervade a house or a chamber, sickness sooner or later must inevitably follow.

I do not propose to enter minutely into the chemical composition of sewer gas. Suffice it to say that, in a concentrated form, it is a poison of so deadly a character that strong men have been instantly killed by it. It will be readily understood, therefore, that however much it may be diluted its presence at all in the air we breathe cannot but be highly injurious.

The deadly element in the gas is not very clearly ascertained. It is generally supposed to be of the nature of organic emanations, subtle and insidious, not itself odorous, though generally accompanied by other gaseous compounds, with the usual sickly and nauseating smell of sewers.

Its access to the system is associated with the necessity of life, which makes air the most essential and constantly received food of man. When poison is present in the atmosphere of a house or sleeping apartment a fresh dose is taken at the rate of at least fifteen times every minute of every hour; and by a cumulative process the almost infinitesimal quantity in each respiration becomes in the aggregate very large.

Its direct action is expressed in the word devitalising. It removes from the atmosphere its active invigorating quality. This is the first effect, and is evidenced in the human system by headache, nausea, languor, drowsiness, indigestion, loss of appetite, and all the general symptoms of impaired vitality. But if the full action of the poison be realised it acts as a malignant ferment in the blood, producing variously low kinds of fever or putrid affections of the throat. In a house whose atmosphere is thus depraved, ordinary illnesses assume an incurable type, the period of childbearing is one of extreme danger, and all surgical operations become what Sir James Paget terms "surgical calamities." The air, as I have said, is devitalised, and the one essential stimulus of all healthy vital action is lost.

It may not be uninteresting to mention that recent experiments go to show that pure oxygen may exist in such a form as not to be able to support life, much more air, which is oxygen in a very dilute condition.

Air, or even oxygen, must be ozonised to be vital in its properties. The chemical constitution of the air may be without fault, carbonic acid gas may not be in excess, but if the air has been in contact with organic emanations its vitalising property is lost until renewed again by electricity or other atmospheric agencies of which we know nothing but their results. Hence the difference between air of town and country, of a crowded court and open plain. The one is spent, the other fresh; the one is quickening, the other depressing; and the germs of fermenting poisons will live in the spent air and be destroyed in the fresh.

Hence, sewer gases, the sure vehicle of all noxious seeds of disease, destroy in the air the power of its own self-purification, and leave those who breathe an atmosphere impregnated however slightly by them a helpless prey to every form of zymotic poisoning.

Thus purity of air is no less essential to health than purity of water and of soil. Pure air, pure water, and pure soil, are the tripod of healthy social life.

And what must be the condition of those who live in a house directly communicating with a sewer, the soil-pipe unventilated, and those within the dwelling protected only by a trap? Still worse if waste pipes, opening into dressing-rooms and lobbies and kitchens, find their exit in the soil-pipe. Any pressure of wind or gas from without, or any suction from heated air within, will suffice to blow through the traps, and render the house an involuntary receiver for every manifold poison that may be present in the town. To live on the crater of a volcano that may burst into fatal activity any moment is not a whit more perilous, but it is inconceivably less filthy; for it must not be forgotten that in a sewer system "the rich and the poor meet together," and the diseases of recklessness and improvidence are thus susceptible of very undesirable extension.

But is there any excuse for those who, unwittingly, may be living exposed to such imminent hazard? I think there is none. The cry of danger is not a newly awakened one. This Association has lifted up its voice continually during many past years. The Legislature has constituted Health Departments as means of instruction, and complaints cannot be made that the press has not given sufficient publicity to their records week by week. And tterly the Association has advertised that it has a staff of mpetent engineers prepared to report upon the condition of any use in these respects, if application be made to it.

And let it be noted that, with a grand and rare unselfishness, e medical profession have nobly sustained the action of the anchester and Salford Sanitary Association in its work of revention; for, I may ask, of what use are drugs to a household ontinually breathing sewer emanations? In such a condition ckness is the permanent rule, and the income of the medical an is established. Dr. Carpenter relates how he was once ughed at in a Parliamentary Committee for advocating the means f the prevention of disease; and a leading counsel candidly sked, "What would be thought of Queen's counsel if they elonged to an association for diminishing or preventing appeals the tribunals of the law?"

And this brings me, in conclusion, to regard this subject from a ider point of view. England is now afflicted with sufficient oubles. Her triumphs of the past are bringing just now a crop serious embarrassments. Her magnificent capacity of colonisa- on involves a limitless frontier of troublesome and unruly eighbours. Her free imports are at present depreciating un- leasantly her own produce and manufactures. But can it be ubted that national advancement is yet in front of us, and is t the single aim of statesmen and the country?

And can it be thought that an improved condition of the wellings of the people, with a diminished toll of preventable eaths, is an inconsiderable factor in the achievement of a higher vilisation? A steady progress here will neither weaken our ontiers nor augment the difficulties of our commercial relation- ips. On the contrary, it will have a beneficial action upon both. will send more brave men to our ever-widening circumference, nd still leave more consumers at home to diminish the price of bour and enhance the value of its results.

But setting aside such more remote considerations, all analogy oints to health as the first concern of reason and of conscience. eglect of health in the individual is suicide, and in the State is urder. What we desire for ourselves we should aim to accom- lish for others. If self-preservation is good for the individual it good also for the State; and it is a practicable achievement for oth. There is no mystery. The facts are to hand, and the laws ell ascertained. All that is wanting is public enlightenment and public conscience in the matter.

Nor can it be thought that the improvement of the dwellings of the people puts before us a narrow area of benefit. The benefit reaches further than is at first sight apparent. It includes the saving of thousands of English lives, valued economically at £200 apiece. (See Farr's Supplement.) It includes the birth and growth of better developed men and women, now too often stunted and enfeebled by the early depressing influence of insanitary conditions. It includes an inheritance of modesty and self-defence in girls too often brought up in conditions where such feelings cannot have a beginning. It includes a diminution of intemperance and crime, which adhere most persistently to houses so constructed that, in them, health and the true enjoyment of life are never experienced. It includes a vast saving in the public expenditure in preserving from sickness those who at its first incidence come upon the rates, and which, when fatal, leaves widows and orphans a permanent charge there. And all these vast and varied benefits—moral, physical, social, and economical—to individuals, communities, and the State—come not singly, but necessarily all combined, as the result of raising the standard of the houses of the people, and removing therefrom all occasions of preventable injury, which are always violations of nature and the occasions of indefinable loss.

Nor let it be thought that the Legislature is now at fault in these matters. On the other hand, the law is at present far in advance of public feeling and education. The Legislature has, in the nineteenth century, affirmed practically in the statutes that the first point of view from which a human dwelling shall be regarded shall be that of health. In laying the first stone, or setting out the foundation of the humblest cottage, no known law of health may be violated. But in the present state of the public mind it is easy to find methods of evading these statutes. Thus the middle class suffer still from the uncertified work of jerry builders; and the poor, in old houses, are too often left with remedial resources of which they are ignorant, or which they dare not put into exercise. It cannot be doubted, however, that the law will eventually triumph; and its very exercise from day to day, throughout every part of the country, under the impartial light of publicity, will advance the cause of public education, which is also the object of the lectures of this society.